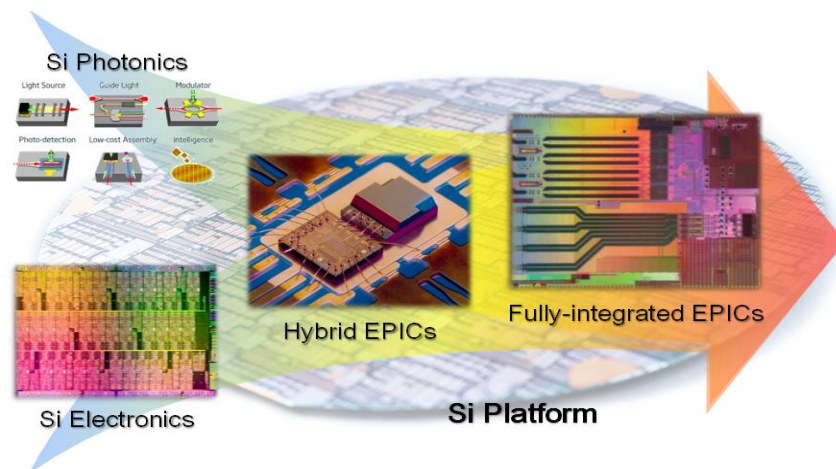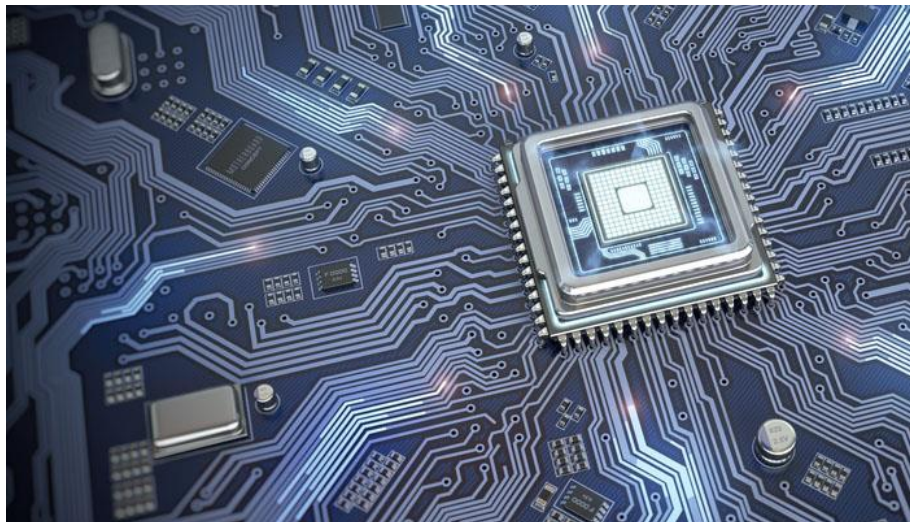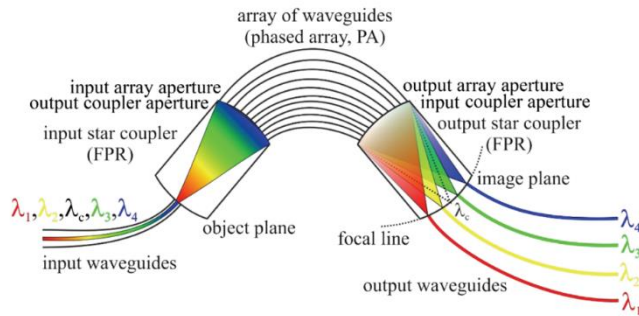# Demands of High-Performance Computing
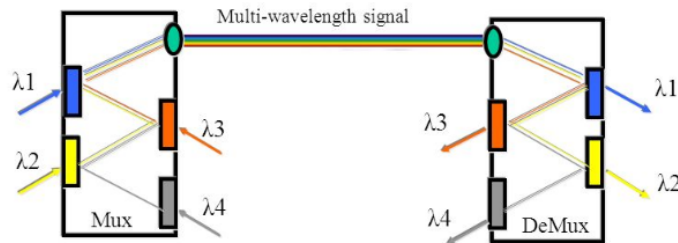

- **Using the existing platform of electronics industry**
  - ➔ *Si Photonics technology*

- **High enough integration to be used in HPC**
  - ➔ *Fully Integrated EPIC (Electronic-Photonic IC)*

- **Using well-known optical communication method**
  - ➔ *WDM (Wavelength Division Multiplexing)*

Comparing of WDM Filters

Conventional WDM Filters
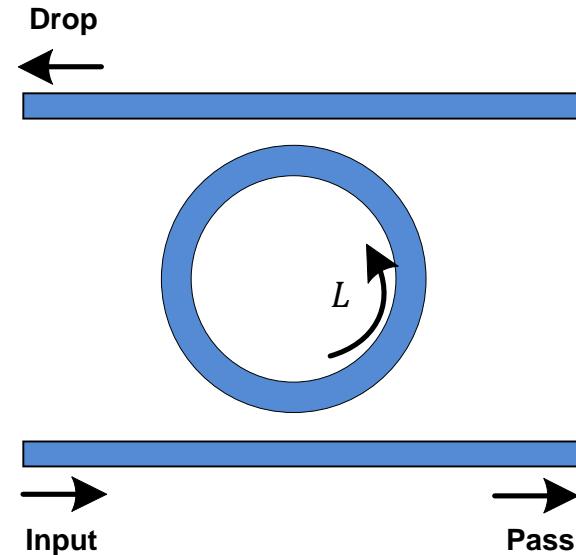

< Arrayed Waveguide Grating >

< Thin Film Filter >
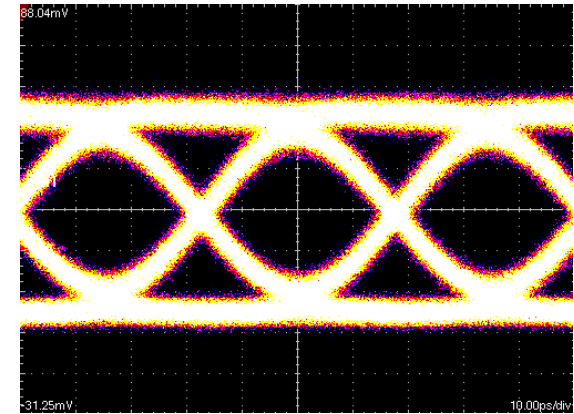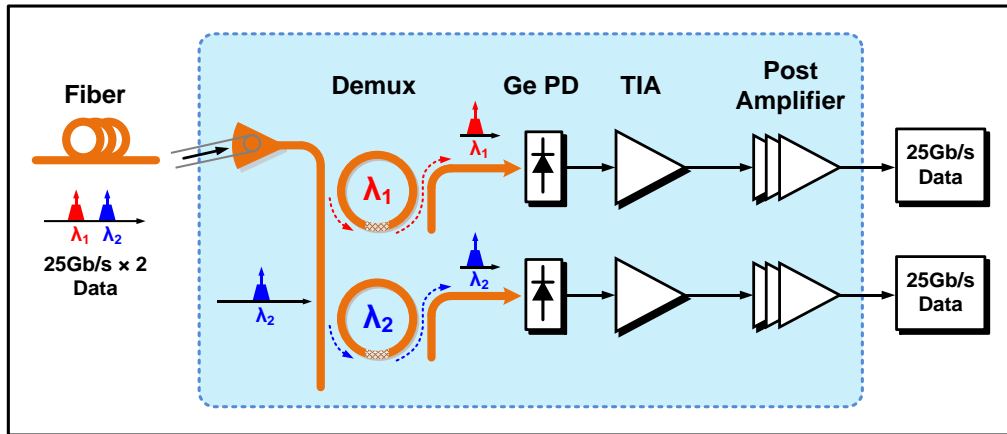
→ *Too large to integrate on chip*

Ring-Resonator

→ **Relatively Small Footprint**
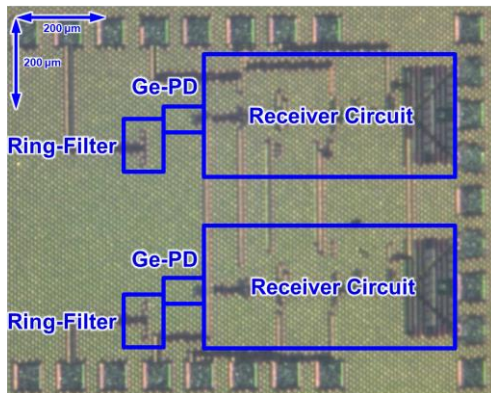→ **Integratable on Chip**

Ring-Resonator can be a solution!

Muti-channel WDM Receiver Optimization

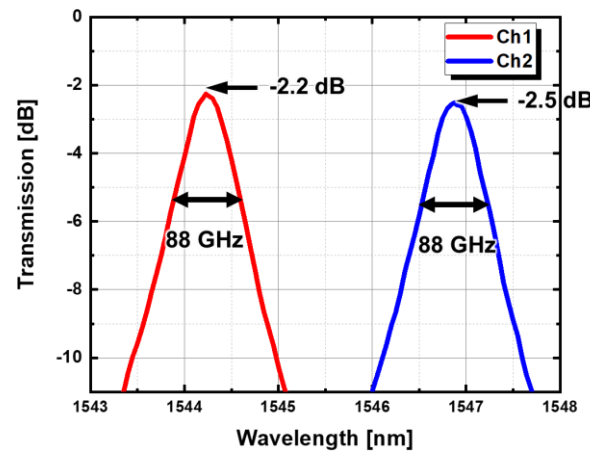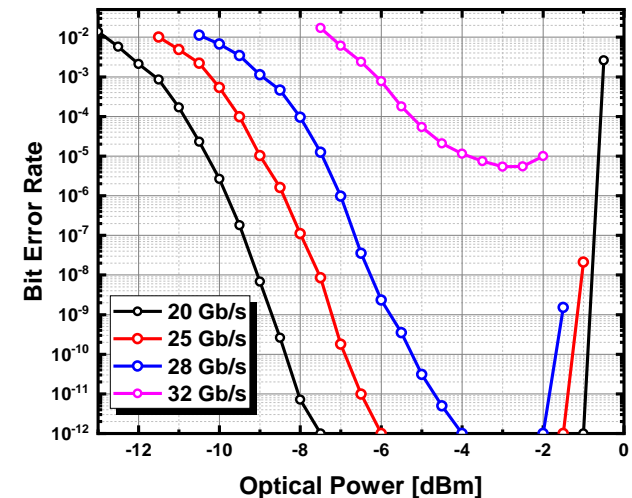- **2 x 25 Gb/s WDM Receiver using Ring-Resonator Filters**

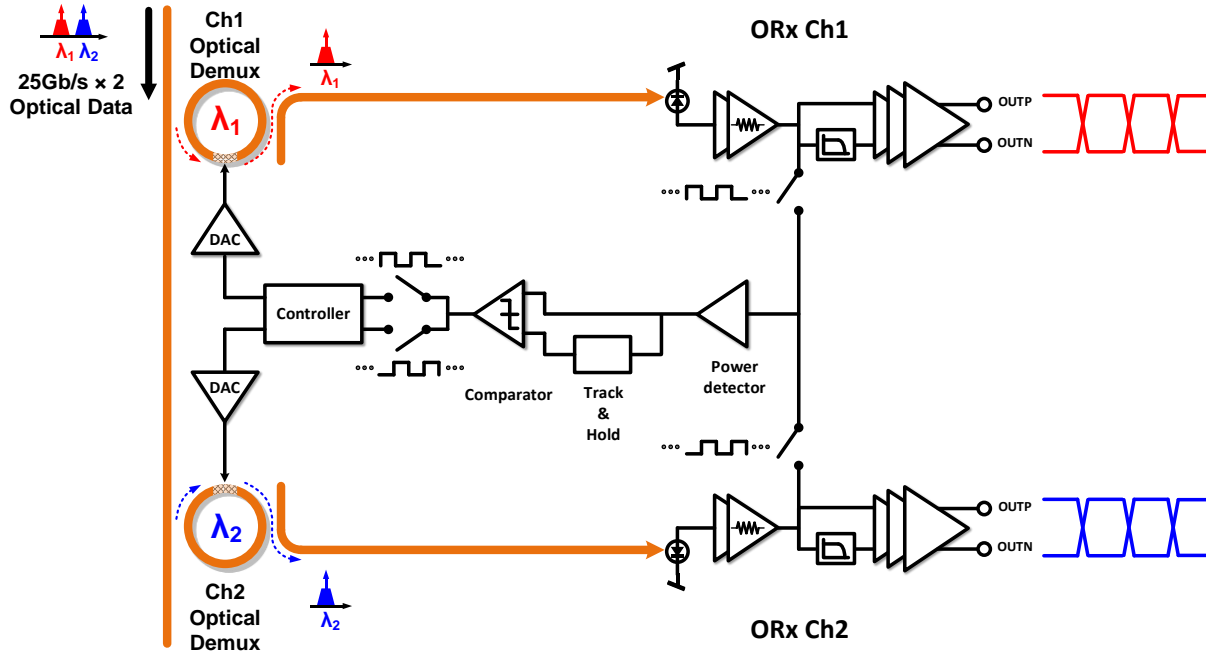**< 25G Eye Measurement >**

< Chip Microphotograph >

< WDM Filter Characteristics >
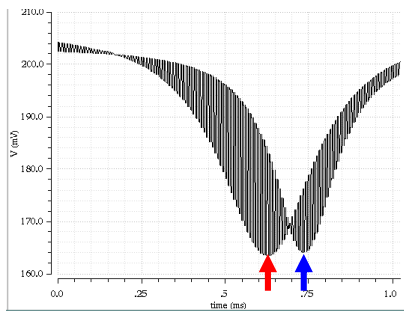
→ **140 pm/mW Tunability**
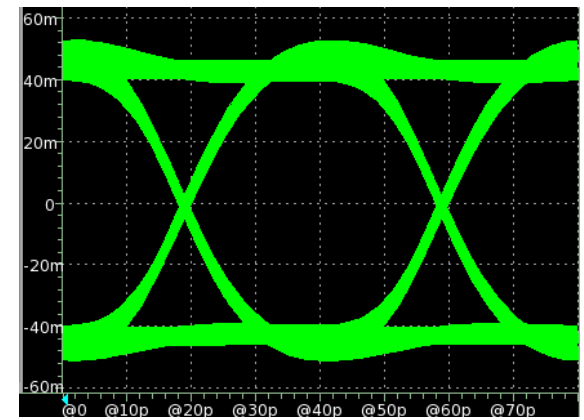

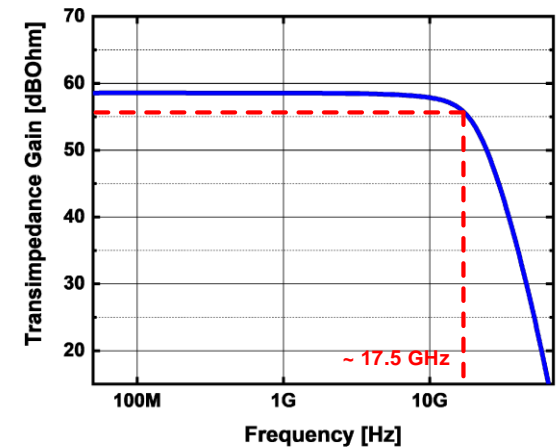**< BER Measurement >**

SPIE 2020 Sumitted
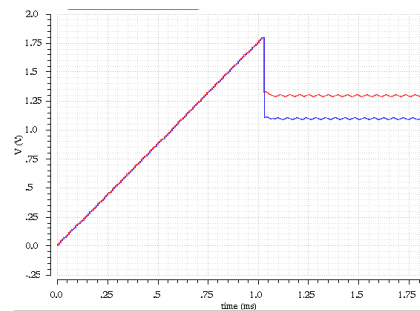
Power-efficient Multi-channel WDM Filter Controller

● **Multi-channel sampling using single monitoring circuit**

< Power Detector Output> < Heater Voltage Stabilization >

< Rx Simulation Results >

~ 17.5 GHz